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# THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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R. B. Wilcox describes "stunt", a destructive but not yet widespread virus disease of blueberry known to occur in New Jersey, North Carolina, and New York, page 211.

K. Starr Chester, page 213, bases a tentative method for the prediction of wheat leaf rust epidemics in Oklahoma on an analysis of environmental conditions and leaf rust incidence during 23 years: on this tentative basis he indicates that 1942 will be among the moderate or light rust years in Oklahoma. In addition, he mentions some of the difficulties involved in adapting this analysis to other regions.

A statement on the current wheat leaf rust situation in Oklahoma is also sent by K. Starr Chester, page 217, while C. O. Johnston reports on cereal rusts in Kansas and C. A. Suneson on the incidence of grain diseases in California, page 218.

E. C. Tims reports the first authentic record of the presence of Allium white rot in Louisiana, page 219, and gives a brief summary of its known occurrences in this country.

H. T. Cook and L. L. Harter report that under the conditions of their experiments wettable Spergon was not an effective surface disinfectant for sweetpotato seed roots, page 222.

In brief notes, page 223, Randall R. Kincaid, reporting tobacco seed bed diseases in Florida this year, says that ferric dimethyl dithiocarbamate, and Spergon, both gave good control of downy mildew when used as sprays; and E. C. Tims reports that pink root was severe on shallots in Louisiana this year.

April weather, page 223.

# TENTATIVE PROGRAM
# AMERICAN PHYTOPATHOLOGICAL SOCIETY
# SUMMER MEETING
# SECOR HOTEL, TOLEDO, OHIO
# JUNE 25-26, 1942

In the rapidly changing times participation in war emergency meetings should be encouraged. The summer meeting of the American Phytopathological Society is definitely a war emergency meeting. It will deal with "The role of plant pathologists in a war emergency program." Emphasis will be placed on activities of the Society's "War Emergency Committee." Everyone will be intensely interested in the progress made by this committee, and in assisting in formulating future activities.

Attend the summer meeting and be informed.

June 25

10:00 a.m. The role of plant pathologists in the war program. -- Summarized by the War Emergency Committee - E. C. Stakman, Chairman.

1:30 p.m. Round table discussion on spray material and spray equipment priorities and substitute materials. (This will include reports by members of the Society and representatives of industry).-- J. G. Horsfall, Chairman.

3:30 p.m. Demonstration of techniques used in determining physical properties of dust mixtures and performance of dusting equipment. -- Co-chairman, J. D. Wilson, Ohio Experiment Station, and Frank Irons, U.S.D.A., Engineering Laboratory.

7:30 p.m. Opportunity for regional, or special committee meetings.

June 26

10:00 a.m. Discussion on extension, research and teaching policies during present emergency. -- Leaders: H. P. Barss, O. D. Burke, N.E. Stevens.

1:30 p.m. Summary of program, policies and future activities of the War Emergency Committee. -- (Members of the executive committee in charge.

Opportunity will arise in various sessions for a discussion of quarantines, the draft, disease surveys, and other subjects which the War Emergency Committee, or members desire.

## CHECK LIST REVISION

Freeman Weiss

ROSA (ROSACEAE)

ROSA spp., CULTIVATED ROSES.* Upright or trailing shrubs, of which the principal garden types are (1) "OLD ROSES", including derivatives of R. gallica L., French or Provence rose, R. centifolia L., cabbage and moss roses, R. damascena Mill., damask rose, R. moschata Herrm., musk rose, and R. cinnamomea L., cinnamon rose; of Europe and W. Asia; cult. Zones IV to VI. (2) BRIER ROSES, as R. foetida Herrm., Austrian Brier and Persian Yellow roses, R. hugonis Hemsl., Hugo rose, R. spinosissima L., Scotch rose; of Europe and W. Asia; cult. Zones IV & V. (3) SWEETBRIER ROSES as R. eglanteria L., eglantine, of Europe; cult. Zone IV and widely naturalized in the U.S.; also crosses with R. foetida producing Penzance hybrids. (4) PERPETUAL BRIER ROSES, as R. rugosa Thunb. and hybrids with various other groups; of E. Asia; cult. Zones II and III. (5) TEA and CHINA ROSES, as R. odorata Sweet, tea rose, R. chinensis Jacq., China and Bengal roses; of China; cult. Zone VII. (6) HYBRID PERPETUAL or REMONTANT ROSES (X R. BORBONIANA), including X R. noisettiana Thory, Noisette and Manetti roses, X R. borboniana Desp., Bourbon rose, which are hybrids of R. chinensis and R. centifolia, R. damascena, R. moschata and R. gallica; cult. Zone IV. (7) HYBRID TEA ROSES (R. DILECTA Rehd.), derived chiefly from crosses between hybrid perpetuals and R. odorata; and also crosses between these and R. foetida producing the Pernetiana hybrids; cult. Zone V. (8) MULTIFLORA ROSES (R. MULTIFLORA Thunb.), including garden roses as Crimson Rambler, and understock roses; E. Asia; cult. Zone V. (9)POLYANTHA (Floribunda) and BABY RAMBLER roses, derived from crosses between R. multiflora, R. chinensis and hybrid teas. (10) WICHURAIANA HYBRIDS, derived from R. wichuraiana Crép., Memorial rose, crossed with R. multiflora and R. laevigata Michx., Cherokee rose; including most of the large-flowered climbers; cult. Zone V. (11) SETIGERA HYBRIDS, e.g., American Pillar, derived from the native R. setigera Michx., prairie rose, crossed with various other groups; cult. Zone IV. (12) EVERGREEN ROSES, including several types, as R. banksiae Ait., Banks' rose, R. bracteata Wendl., McCartney rose (var. Mermaid), and R. laevigata Michx., Cherokee rose; all of E. Asia; cult. Zone VII.

* Because of the many and ambiguous species composing the horticultural roses and to some extent the native rose flora, species differentiation within these two groups is not attempted here, but the cultivated roses, which are predominantly derived from Asiatic and European species are segregated from those indigenous to our range or naturalized here.

CULTIVATED ROSES -- continued

Alternaria sp. (usually reported as A. brassicae (Berk.) Sacc.,= A. circinans (Berk. & Curt.) Bolle), on leaves, ? leaf spot. Va. to Ala. & Texas, occasionally elsewhere.

Armillaria mellea Vahl ex Fr., root rot. Calif., Miss., Oregon, Texas, Wash.

Botryosphaeria ribis var. chromogena Shear et al., canker, dieback. Ala., Md., Texas, Va.

Botrytis cinerea Pers., bud & twig blight, sometimes storage mold. Cosmopolitan.

Cercospora puderi B.H.Davis, leaf spot. Fla., Ga.

C. rosicola Pass. Conidial stage of Mycosphaerella rosicola.

Chalaropsis thielavioides Peyronel, black mold, (Manetti mold") of grafts. Ill., N.Y., Pa. on understocks from Oregon & Wash.

Cladosporium sp. and C. fuscum Lk. ex Fr., leaf & bud mold. Alaska, Md., Minn., Miss., Texas.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.

Coniosporium limoniiforme Syd., on leaves. Utah.

Coniothyrium fuckelii Sacc. Conidial stage of Leptosphaeria coniothyrium.

C. rosarum Cke. & Harkn. (probably = C. fuckelii), graft canker. Calif., Iowa, Mass., Minn., N.J., Pa.

C. wernsdorffiae Laubert, brand canker. Colo., Ind., Minn., Miss., N.Y., Pa., Texas.

Corticium stevensii Burt, thread blight. Fla., La.

Coryneum microstictum Berk. & Br. Conidial stage of Griphosphaeria corticola. (The var. foliae Dearn. & Overh. is reported on leaves in N.Y.).

Cryptosporella umbrina (Jenkins) Jenkins & Wehmeyer (Diaporthe umbrina Jenkins) brown canker of canes, also on buds & flowers. Mass. to Fla., Texas, Nebr. & Mich.; Calif., Idaho.

Cryptosporium minimum Laubert, canker. Oregon, Pa.

Cucurbitaria rosae Wint. & Sacc., on canes. N. Mex., N.Y.

Cuscuta indecora Choisy and C. paradoxa Raf., dodder. Texas, Fla.

Cylindrosporium scoparium Morgan, basal canker (crown canker). Mass. to Ga., Texas & Ill.

Cytospora sp., dieback. Ky., Pa., Va., Wash.

Dermatea rosae (Sacc.) Rehm, on twigs. N.Dak.

Diaporthe eres Nits. (Phomopsis sp.), on canes, twigs and buds. Calif., Ga., La., Md., Mo., N.Mex.

Didymella nigrificans Karst., on canes. N.Mex.

D. sepincoliformis (DeNot.) Sacc., dieback. Md.

Diplocarpon rosae Wolf (Actinonema rosae (Lib.) Fr.), blackspot. General.

Diplodia spp., canker, dieback (probably secondary). N.J. to Fla., Texas & Nebr. D. natalensis Pole-Evans, Texas; Conidial stage of Physalospora spp.

Discosia artocreas Tode ex Fr., on buds & stems, probably saprophytic. La., Miss., Mo., Ohio.

Dothiorella sp., blossom blight, also on twigs & canes. La., Va.

CULTIVATED ROSES -- continued.

Fusarium spp., root rot. Occasional, chiefly in the South; not shown pathogenic.

Gloeosporium spp., twig & cane blight. Widespread. In part G. rosaecola Dearn. & Barth. or G. rosarum (Pass.) Grove, synonyms of Sphaceloma rosarum; in part the conidial stage of the following.

Glomerella cingulata (Ston.) Spauld. & Schrenk, dieback. Md.,N.J., Va.

Griphosphaeria corticola (Fckl.) Höhn. (Coryneum microstictum Berk. & Br.), canker, dieback. N.H. to Ala., N.Dak., Pacific Northwest.

Guignardia spinicola (Ell. & Ev.) Lindau, on thorns. Pa.

Heterodera marioni (Cornu) Goodey, root knot. Conn. to Fla.; Mich. & Nebr.; Texas to Calif. (Reports from North pertain mostly to greenhouse roses).

Leptosphaeria coniothyrium (Fckl.) Sacc. (Coniothyrium fuckelii Sacc.), graft canker, common canker, sometimes leaf spot. General. (Leptothyrium rosarum Cke.): Pezizella oenotherae.

Macrophoma sp., ? dieback. Texas, Va. Conidial stage of Physalospora sp.

Monochaetia compta (Sacc.) Allesch. (= M. depazeoides (Otth.) Allesch.?), leaf spot. Alaska, Iowa, Kans., Md.

Mycosphaerella rosicola B.H. Davis (Cercospora rosicola Pass.), leaf spot. General except possibly the far South.

M. rosigena (Ell. & Ev.) Lindau, leaf spot. La., Md., N.J.; N.Y.; Canal Zone, P.R. Possibly confused with the preceding and not certainly distinct; apparently more southern in distribution.

Myxosporium rosae Fckl. Reported occurrences are the conidial stage of Cryptosporella umbrina or of Diaporthe eres.

Nectria cinnabarina Tode ex Fr., coral spot on twigs & canes. Mass. to Va.; Wash., Alaska.

Peronospora sparsa Berk., downy mildew (chiefly on cuttings under glass). Me. to Fla. & Iowa; Calif.

Pestalotia spp., associated with leaf, stem & bud necrosis but probably secondary; not critically identified. P. compacta Berk. & Curt., Fla.; P. discosioides Ell. & Ev., Del., Mich.; P. rosae Westend., N.J. to Ala. & Texas; P. suffocata Ell. & Ev., Pa.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves & stems. N.J. to Fla., Texas & Mich.

Phoma spp., on thorns & twigs. Widespread. Probably Phomopsis.

Phomopsis spp., on thorns, bark & buds; associated with canker & dieback, but probably secondary. Widespread. In part Diaporthe eres Nits., as P. incarcerata (Sacc.) Höhn.

Phragmidium americanum (Pk.) Diet., rust (O,I,II,III) on leaves of cult. and native roses. Me. to N.Car., Texas & N.Dak.

P. disciflorum (Tode) J.F. James, rust (O,I) on leaves and stems, II & III on leaves, chiefly of cult. roses of the R. gallica group. Eastern States to Rocky Mts., Pacific Coast, T.H.

CULTIVATED ROSES -- continued.

Phragmidium speciosum (Fr.) Cke., rust O & I on leaves & stems, III on stems of cult. and native roses. Throughout the U.S., except the far South.

P. subcorticinum (Schrank) Wint., rust O & I on stems, II & III on leaves. Commonly on cultivated roses of the brier and sweetbrier groups. Reported from all the States except the Southeast and Southwest, and also Alaska, but Arthur (Manual of Rusts) gives the distribution as "northern U.S. east of the Rocky Mts."

Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.

Phyllosticta spp., on lvs. P. erratica Ell. & Ev., Ala.; P. rosae Desm., widespread; P. rosicola Massal, N.J. Probably spermatial stages of Mycosphaerella.

(P. rosarum Pass.): Sphaceloma rosarum

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Texas.

Physalospora fusca N.E. Stevens, on canes. Fla., Ga.

P. obtusa (Schw.) Cke., cane blight. Conn. to Ala., Texas & Kans.

P. rhodina (Berk. & Curt.) Cke., on canes. Fla., N.Car.

Phytomonas rhizogenes Riker et al., hairy root. Pa., Texas.

P. syringae (Van Hall) Bergey et al., shoot blight. Ark.

P. tumefaciens (EFS. & Town.) Bergey et al., crown gall, stem gall. General.

Pilobolus sp., on leaves of greenhouse roses; superficial but unsightly, the sporangia discharged from coprophilus fungi. Occasional.

(Pleosphaerulina corticola (Fckl.) Rehm): Griphosphaeria corticola.

Pratylenchus pratensis (DeMan) Filip., in roots. Ohio.

Ramularia macrospora Fresen., root & collar rot. Md.

Sclerotium rolfsii Sacc., Southern blight. Fla., Kans., Texas.

Septoria rosae Desm., leaf spot. Miss., N.J., S.Car., P.R.

Sphaceloma rosarum (Pass.) Jenkins, anthracnose. Me. to Fla., Texas & Kans.; Pacific Coast States.

(Sphaeropsis rosarum Cke. & Ell.): Physalospora obtusa.

Sphaerotheca humuli (DC.) Burr. and S. pannosa (Wallr.) Lév., powdery mildew. General. Following Salmon (Monograph of the Erysiphaceae) rose mildew has been widely attributed in the U.S. to the first named sp., especially on wild roses and on the foliage of greenhouse roses as distinguished from that more prevalent on the buds & shoots of garden roses. Other studies indicate that greenhouse rose mildew is caused in the U.S. as in Europe by S. pannosa var. rosae Woronichine. Both S. humuli and S. pannosa have been authentically identified on roses in the perithecial stage but most collections include only the conidial stage in which the two are hardly distinguishable; this may account for conflicting reports on varietal resistance.

Valsa ambiens Pers. ex Fr., on dead canes. Cosmopolitan.

Verticillium sp., wilt. Ark., N.Y.

V. albo-atrum Reinke & Berth. Calif., N.J., Ill.

Chlorosis, mineral deficiency due to alkaline soil. Nebr., Texas.

CULTIVATED ROSES -- continued.

Crinkle, -- virosis-like but not shown transmissible, occurring especially in var. Manetti and other understock roses, sometimes in garden roses. Pacific Coast States, Texas; also Md., N.Y., Pa. & Va.

Mosaic (infectious chlorsis), Rosa virus 1 Brierley ex Smith (Marmor rosae Holmes). Chiefly on greenhouse roses in Eastern and Central States, sometimes on garden roses; identified but infrequent on understock and other roses in Pacific Coast States. A yellow variety, Rosa virus 2 Brierley ex Smith, is reported in Md., N.Y., Pa.Ill.,Va.,and possibly (as rose viruses 2 and 3 Thomas & Massey) also in Calif. Rosa spp. have been shown experimentally susceptible to the viruses of apple mosaic and Winter's peach mosaic.

Pedicel necrosis (collapse of flower stem), cause unknown. N.Y. to Md. & Ohio.

Root gall (in R. odorata), cause unknown, probably non-parasitic. Calif., Md.

Rough bark, cause unknown, possibly virus. Calif.

Speckle, -- chlorotic flecks in leaves, cause unknown; not transmitted by grafting. Occuring especially on R. multiflora, and sometimes other roses, in Md., N.J., N.Y., Pa., Texas, Va.

Streak (? veinal chlorosis), Rosa virus 4 Brierley ex Smith (Marmor veneniferum Holmes). On various kinds of roses in Md., N.J., N.Y., Texas, Va.

ROSA spp., native to the U.S. and its possessions. Of about 15 native spp. of roses, only R. setigera Michx, prairie rose, has been used extensively in horticulture but forms of the following also are cultivated: in Zone III, R. nitida Willd., R. nitida Willd., R. suffulta Greene, R. virginiana Mill., R. woodsii Lindl.; in Zone IV, R. acicularis Lindl., R. arkansana Porter, R. carolina L.; in Zone V, R. californica Cham. & Schlecht., R. foliolosa Nutt., R. nutkana Presl. Several spp. are important in erosion control or furnish forage and wild life food. The following introduced spp. have become naturalized: R. bracteata and R. laevigata in the South; R. canina, R. cinnamomea, R. eglanteria, R. gallica, R. micrantha and R. spinosissima in the Eastern States; R. eglanteria in the Pacific Northwest. In the following list, the reported occurrences apply to several but not necessarily all of these spp. unless a more restricted distribution is stated.

Botryosphaeria ribis (Tode ex Fr.) Gross.& Dug. and var. chromogena Shear et al., canker, dieback. Md., Va.

Cercospora sp., leaf spot. Mich.

(C. rosicola Pass.): Mycosphaerella rosicola.

Cryptosporella umbrina (Jenkins) Wehmeyer & Jenkins, brown canker. Md., Mich., N.J., N.Y., Va., W.Va.

ROSA spp., native -- continued.

Diatrype tristicha DeNot. (Valseutypella tristicha (DeNot.) Höhn.), on dead stems. Calif., N.D.

Diplocarpon rosae Wolf, black spot. Widespread, but infrequent.

Diplodia sarmentorum Fr., on branches. Calif.

Griphosphaeria corticola (Fckl.) Höhn., canker, dieback. N.Dak.

Leptosphaeria coniothyrium (Fckl.) Sacc., canker, dieback. Va.

Mycosphaerella rosicola B.H.Davis, leaf spot. Ga. & N.Car. to Kans. & Wis.; Wash.

Nectria cinnabarina Tode ex Fr., coral spot, dieback. Alaska, N.Y.

Peronospora sparsa Berk., downy mildew. Calif., Texas.

Phoma sepincola (Kickx) Sacc., on twigs. Nebr.

Phragmidium americanum (Pk.) Diet., rust (O,I,II,III). Eastern States to Mont. & Texas.

P. disciflorum (Tode) J.F.James, rust (O,I,II,III). Ill., Kans., Wis. (Usually on cult. roses, occurrence on native spp. not critically confirmed).

P. montivagum Arth., rust (O,I,II,III). S. Dak. to N.Mex., Ariz. & Wash.

P. rosae-acicularis Liro, rust (O,I,II,III). Mich. to Colo. & Idaho; Alaska.

P. rosae-arkansanae Diet., rust (O,I,II,III). Ill. to Colo. & Wyo.; Calif.

P. rosae-californicae Diet., rust (O,I,II,III). Ariz., Calif., Mont., Oregon.

P. rosicola (Ell. & Ev.) Arth., rust (III). Colo., Mont., Nebr.

P. speciosum (Fr.) Cke., rust (O,I,III). On R. acicularis. Eastern States to Rocky Mts.

P. subcorticinum (Schrank) Wint., rust (O,I,II,III). Colo., Me., Minn., Mont.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.

Phyllosticta rosae Desm., leaf spot. N.Y. to Fla. & Ind.; Colo.

(P. rosarum Pass.): Sphaceloma rosarum.

Physalospora obtusa (Schw.) Cke., on canes. Md.; N.Dak., Va.

Sphaceloma rosarum (Pass.) Jenkins, anthracnose. N.Y. to Mich. & Texas; Oregon.

Sphaeronemella rosae Ell. & Ev., on canes & twigs. Md., N.J., Va.

Sphaerotheca humuli (DC.) Burr., powdery mildew. Conn. to Va., Texas, Calif. & Wash. According to Salmon, the most common sp. on roses in the U.S.

S. pannosa (Wallr.) Lév., powdery mildew. General. According to Salmon, S. pannosa is infrequent among American collections, but this name is widely used in reports.

Valsa ambiens Pers. ex Fr., on dead stems. N.Y., N.Dak.

Crinkle, cause unknown. On R. gymnocarpa and R. nutkana. Oregon, Wash.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

## BLUEBERRY STUNT, A VIRUS DISEASE

R. B. Wilcox

A disease of the swamp or high-bush blueberry (Vaccinium australe Small (V. corymbosum L.)), locally known as "stunt", has been under investigation in New Jersey for several years. Microscopical examination and attempts at isolation have failed to indicate the presence of a parasitic organism. The trouble has not been corrected by the use of commercial fertilizers or by applications of various chemicals to the soil or to the foliage.

Cuttings made from "stunted" wood have not rooted, and buds taken from obviously stunted canes, when set in healthy shoots, died without transmitting the disease. In early September, 1940, however, buds were taken from apparently healthy canes of slightly diseased bushes and inserted into young canes of healthy plants. These produced shoots the following spring that showed unmistakable symptoms of stunt by July, and in another month the disease had appeared on non-budded shoots from the crowns of the stock plants. These non-budded shoots plainly showed the foliage and branching characters of stunt before dropping their leaves in the fall.

This development of the disease in shoots originating from buds from diseased plants and the spread to adjacent shoots, the apparent absence of a pathogenic organism, the failure of chemicals to correct the condition, and the character of the natural spread in the field, seem to constitute adequate evidence that the malady is a virosis.

The general effect of the stunt disease is a reduction in the length and vigor of new growth, a moderate stimulation of branching, and the production of small unmarketable fruit. Affected bushes when normally pruned make very few basal shoots. It is the common practice of blueberry growers to prune back severely, even to the crown, all weak or unproductive bushes, in an attempt to force vigorous growth for renewal. When bushes infected with this disease are given such severe treatment they respond by forming many weak shoots that by midsummer show a tendency toward cessation of terminal growth and develop branches near the tip at sharp angles with the stem. This stunted condition or appearance of the bushes has given rise to the name "stunt." On recently infected vigorous bushes the new shoots may attain a height of 3 feet, but in advanced stages of the disease they will not exceed half that height and sometimes will grow only a few inches. Although individual shoots of infected bushes may die during their first winter, the bush may live for several years.

Usually from 2 to 5 of the youngest leaves of an infected basal shoot are pale green or yellowish at the tip and on the margins (especially of the distal half of the leaf), seldom between the veins. This apical-marginal pallor may be so indistinct as easily to escape notice, but it is one of the earliest and most constant signs of the disease. Less often the young leaves appear almost completely etiolated. There is no mottling of the foliage. All leaves are reduced in size to some degree, and the internodes shortened.

Symptoms on mature fruiting canes are somewhat different. Few large branches are produced, but there are likely to be many fruiting laterals, short, slender, and with crowded leaves, giving the plant a bushy appearance. Fruit buds form except in the most advanced cases, and develop in the spring into flowers and berries; the latter color normally but remain very small, have a characteristic, unpleasant taste, and do not separate easily from the stems; these berries may hang on the bush until after the leaves have fallen in autumn. On stunted bushes of most varieties, the foliage of mature canes by midsummer takes on a brilliant, orange-red coloration that persists until the leaves drop. The color is similar to that caused by other conditions, such as wet soil or deficiency of magnesium, but its location in the leaf is distinctive. It appears in 2 longitudinal, indefinitely limited, bands or stripes, at or just inside the margin, with the central portion of the leaf (including the base and usually the tip) remaining green. In advanced cases of the disease the leaf margins may become necrotic and brown, with the 2 parallel red stripes moved inward toward the midrib. This coloration is strikingly conspicuous until fall frosts give a general reddish color to the foliage. There is at least one susceptible variety, the Rubel, on which the red color characteristic of stunt does not develop.

There seem to be varietal differences in susceptibility to stunt, but whether these are real or are due to partial or complete suppression of symptoms has not been determined. The disease has not been recognized on the Rancocas variety. On Rubel, the usual symptoms appear except for the red color on the foliage of mature canes. The disease has been found most commonly on Cabot, Concord, Pioneer, Rubel, and Scammell, but these are not necessarily the most susceptible. Scattered cases have been found on a number of other commercial varieties, and on certain unnamed hybrids. The reaction of several recently introduced varieties to infection is not known.

The disease was first observed on old bushes of unnamed hybrids in a trial field at Whitesbog, New Jersey, and later appeared in nearby rows of the Concord variety. Several miles distant, it developed on numerous plants in another field of unnamed hybrids, where the bushes were 8 years old and very vigorous; this is the youngest field now known to show heavy infection. New Jersey plantings in which stunt has become abundant number less than a half dozen, but scattered cases have been found in many other fields in the State. Stunt has been found in considerable amount in 2 fields in North Carolina, and to a slight extent in a third planting. It has been identified on bushes sent from New York State, and may occur also in other regions where the high-bush blueberry is cultivated.

The means of dissemination of the disease in the field is not known. Attempts to transmit it by pruning shears or other mechanical devices have failed, and there is no evidence that field transmission ever occurs in this way. It is suspected that some insect is the vector, but none has yet been identified. In a field in which some plants are known to have been diseased for years, new cases of stunt have developed at times on bushes near infected ones, most commonly in the immediate vicinity, and less frequently with increase in distance. The occasional lack of spread from known diseased bushes over a period of several years, and the slow rate of advancement in most fields, indicates either that a vector is not commonly present or that other conditions inhibit transmission of the virus.

The disease has not been recognized on nursery stock. It has been found on very few plants that have been in the field for as short a time as 2 years, and has appeared mostly on mature bushes. Nevertheless, in spite of the difficulty of rooting cuttings from diseased wood, it seems probable that the disease may be carried in cuttings having incipient infection, and that the expression of symptoms in the young plants is usually delayed. It should be added, however, that the very early symptoms of stunt were not definitely known until the disease was observed in the budded plants in 1941, and that increased knowledge of these early symptoms may aid in identifying the disease in younger plants and even in nursery stock.

Observation of the development of the disease in the budded plants made it possible for the first time to distinguish clearly between this and other blueberry troubles which have heretofore been included under the general name of stunt. Certain of these other troubles may prove to be due to other viruses; some are perhaps closely related to the disease under discussion; and one or two are probably genetic in character. Symptoms suggestive of stunt, but distinguishable from it, have also been induced by environmental conditions, especially by very poor drainage or actual flooding of parts of fields.

Plants infected with stunt may live for several years, but in many cases they have been removed from commercial fields, usually after having been severely headed back. Bushes lacking in strength and productiveness, though growing in an apparently favorable environment, can sometimes be invigorated by heavy pruning; if, however, the weakness is due to stunt infection, the heading-back will bring out unmistakable symptoms of the disease in young shoots. It is now recommended that, as soon as possible after a bush is found to be affected with stunt, it be pulled up and removed from the field. This eradication must be one of the first steps in control, and should become progressively more effective with increasing knowledge of the early symptoms of the disease. Plants growing in fields in which stunt is known to occur should be avoided as sources of propagating material.

(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY).

## A SUGGESTED BASIS FOR THE PREDICTION OF WHEAT LEAF-RUST EPIPHYTOTICS

K. Starr Chester

The general features of the phenological background favoring epiphytotics of wheat leaf rust (*Puccinia triticina* Eriks.) [*P. rubigo-vera tritici* (Eriks. & Henn.) Carl.] are well known; the details of this requisite background are intricate and elusive. In this case, as with other plant diseases, there are doubtless many concomitant circumstances that have nothing essential to do with the disease and that obscure the group of necessary antecedent circumstances without which serious rust outbreaks cannot occur. Many of the factors necessary for epiphytotic development of leaf rust are present in all years: virulent primary in-

oculum, large acreages of susceptible wheat, a level of soil fertility permitting the development of susceptible types of leaf tissues, development of the crop at a season of the year favorable to rust activity, strong winds to effect the dispersal of rust spores. Indeed, the only factors that fluctuate in such a way as to produce or inhibit leaf rust development over large wheat areas are temperature and moisture. But here we are dealing with limitless variations and combinations during the 10 months in which winter wheat completes its life cycle. Doubtless the temperature and moisture relationships during a considerable part of this period are of little consequence in leaf rust epiphytology, while at other critical times these factors may play an all-decisive role in determining the outcome of the disease.

Observers commonly mention as the factors primarily responsible for leaf rust severity: abundant inoculum in the fall, a mild winter to permit generous survival of the inoculum, and a wet spring. These conditions seemed to have been met in Oklahoma in the spring of 1942. In the fall of 1941 leaf rust was unusually abundant. The winter was 2° warmer than normal. Subsoil moisture, testifying the abundance of rains, stood at the highest level in many years. January was warmer than normal and though dry was followed by normal rainfall in February. March precipitation was deficient (50% of normal) but in April, the month during which leaf rust commonly becomes conspicuous, the rainfall reached an all-time high total of more than 11 inches. Yet on May 1, many of the fields in the leading wheat areas of the State were so lacking in rust that it was not practical to collect small samples for culturing, while in the remainder of the fields the disease was nowhere threatening as the crop passed into the heading stage.

This anomalous situation suggested the desirability of a detailed analysis of the relationship between moisture and temperature on the one hand and leaf rust development on the other, at various periods in the development of the crop. Data on leaf rust occurrence in Oklahoma were available from published and unpublished sources, while the records of the U. S. Weather Bureau provided the necessary meteorological data. The study covered the 23-year period in Oklahoma from 1918 to 1941. The findings most pertinent to the problem presented are given in Table 1.

The 23 years included 8 in which leaf rust damage varied from moderately severe to very severe (5% to 27% loss), 10 years with moderate (2 to 5%) loss, and 5 years in which the rust was negligible (0 to 2% loss). Considering first those years of severe leaf rust intensity (Table 1, upper group), a strong similarity is seen in the phenological conditions from midwinter to the end of March. In all cases the winter was mild (very mild in all but one). In January and February of each epiphytotic year precipitation was normal or above normal. In each year March had normal or warmer than normal temperatures and precipitation varying from normal to excessive. The outstandingly severe epiphytotic of 1938 followed an early spring that differed from the others in the group only in the somewhat greater amount of moisture both in the January-February period and in March. In marked contrast were the phenological variations in late fall and in April. Severe epiphytotics occurred in crop years in which the fall seasons and the months of April each varied from very warm to cool and from very wet to very dry.

Table 1. -- Phenological factors in wheat leaf rust development in Oklahoma, 1918 to 1941. Underlined factors are considered inhibitory to serious rust development. Terms relating to temperature and precipitation are based on departures from normal temperature and precipitation values as given by the U. S. Weather Bureau.

| | Non-essential | | Essential (critical period) | | | | Non-essential | | |
|---|---|---|---|---|---|---|---|---|---|
| Crop Year | Oct.-Nov. Temp. | Oct.-Dec. Pptn. | Dec.-Feb. Temp. | Jan.-Feb. Pptn. | March Temp. | March Pptn. | April Temp. | April Pptn. | Wheat Leaf Rust |
| 1918-19 | Sl. warm | V. wet | Mild | Normal | Normal | Normal | Normal | V. wet | Severe |
| 1920-21 | Sl. cool | V. wet | V. mild | Sl.wet | Moderate | V. wet | Normal | Normal | Mod. severe |
| 1921-22 | Warm | Dry | V. mild | Normal | Normal | V. wet | Normal | V. wet | Mod. severe |
| 1926-27 | Normal | Wet | V. mild | Sl.wet | Normal | Wet | V. warm | V. wet | Severe |
| 1933-34 | Warm | Sl. dry | V. mild | Normal | Normal | Normal | Warm | Dry | Severe |
| 1934-35 | V. warm | Sl. dry | V. mild | Normal | Warm | V. wet | Cool | V. dry | Severe |
| 1937-38 | Cool | Sl. dry | V. mild | V. wet | Warm | V. wet | Normal | Normal | V. severe |
| 1938-39 | V. warm | V. dry | V. mild | Wet | Moderate | Normal | Normal | Dry | Mod. severe |
| 1919-20 | Cool | V. wet | Cold | Normal | Normal | Wet | Cool | Dry | Moderate |
| 1922-23 | Sl. warm | Normal | V. mild | Normal | Cool | Wet | Normal | Wet | Moderate |
| 1925-26 | Cold | Sl. dry | V. mild | Normal | Cool | Wet | Cold | Dry | Moderate |
| 1927-28 | V. warm | Sl. dry | Mild | Normal | Moderate | Dry | Cold | Dry | Moderate |
| 1928-29 | Warm | Wet | V. cold | Normal | Moderate | V. wet | V. warm | Dry | Moderate |
| 1929-30 | Cold | Normal | V. cold | Sl.wet | Normal | V. dry | V. warm | Dry | Moderate |
| 1930-31 | Normal | Sl. wet | V. mild | Normal | Cold | V. wet | Cool | Dry | Moderate |
| 1931-32 | V. warm | V. wet | V. mild | V.wet | Cold | V. dry | Warm | V. dry | Moderate |
| 1932-33 | Cool | Normal | Cold | Normal | Moderate | Normal | Normal | Normal | Moderate |
| 1940-41 | Sl. warm | Sl. wet | Mild | Wet | Cool | V. dry | Normal | V. wet | Moderate |
| 1923-24 | Cold | V. wet | Mild | Dry | Cold | V. wet | Normal | Wet | Light |
| 1924-25 | V. warm | Dry | Cold | Dry | Moderate | V. dry | V. warm | V. wet | Light |
| 1935-36 | Sl. cool | Normal | V. cold | V. dry | Warm | V. dry | Normal | V. dry | Light |
| 1936-37 | Cool | Sl. dry | Cold | Normal | Cool | Normal | Normal | V. dry | Light |
| 1939-40 | Warm | Dry | V. cold | Normal | Moderate | V. dry | Normal | V. wet | Light |

Abbreviations: Sl.: slightly; Mod.: moderately; V.: very; Temp.: temperature; Pptn.: precipitation.

It is noticeable that the conditions favoring severe leaf rust do not necessarily include excesses of rainfall. The essential appears to be the avoidance of subnormal deficiency of temperature or precipitation during the critical period from December to the end of March. Note that the epiphytotic of 1919 and that of 1934 were in seasons of normal precipitation from January to the end of March, in the one case preceded and followed by wet weather, in the other case preceded and followed by dry weather.

If the conditions from late winter to the end of March, as indicated in the table, are the essentials for epiphytotic leaf rust development, it should follow that every non-epiphytotic year should be deficient in one or more of these essentials. Such is the case. In the group of years in which leaf rust was only of moderate intensity 1 essential factor, or occasionally 2, were lacking each year: the winter temperatures were severe, or March was either cool to cold or dry to very dry.

The group of years with very minor rust occurrence shows even greater defects in the period of late winter till March. Here, in each case, 2 or even 3 of the essential factors are lacking.

In these latter groups, the weather of late fall or of April again bears no consistent relation to subsequent rust outbreaks. In 3 of the "light rust" years, April was wet to very wet and April temperatures were normal or warm. In the season 1922-23 conditions were very similar to those of some of the epiphytotic years with the one exception of the low temperatures in March. This, nevertheless, apparently sufficed to inhibit epiphytotic development for that year.

On the basis of this analysis the situation in 1942 is readily explainable. Throughout the critical period, temperatures were favorable but the greater part of the precipitation available for the 1942 crop came at times before and after the critical period for destructive rust development. During this period 2 months were notably dry, January and March, which, if our analysis is valid, should clearly place 1942 among the moderate or light rust years despite the excessive moisture and rapid rust development in April.

If the conditions requisite for epiphytotic leaf rust development are fulfilled 2-1/2 months before harvest and losses from the disease are thereafter relatively independent of weather, it should be possible to predict on March 31, in the latitude of Oklahoma, the approximate crop damage to be expected by harvest time in June. This could be done either by observation of the rust severity at that time or by analysis of the weather record from December through March. For other latitudes correspondingly earlier or later dates would apply. That such predictions would be useful should be evident to those crop observers who, in 1938, participated in the contradictory forecasts on leaf rust damage which were not resolved until harvest was well under way. To be sure, it would be impossible for preventive measures to intervene as late as 2-1/2 months before harvest, but the predictions would be early enough in years of severe epiphytotics to allow a reduction of loss by harvesting the wheat for hay and planting corn, sorghums, or cotton to replace a potentially ruined wheat crop. Such predictions would also aid in stabilizing the reactions of the stock market to overoptimistic crop forecasts.

It is admitted that an analysis such as the present one is handicapped by many factors, such as the inadequacy in past years of data on rust prevalence, the former tendency to underestimate leaf rust losses, and the variation in weather and rust from one part of a State to another. Moreover the entire character of leaf rust epiphytology may differ from one part of the United States to another, owing, for example, to the greater importance of northward-borne spore showers in the Northern States than in the Southwest where leaf rust regularly overwinters in large amounts, or to differences between spring and winter wheats.

The writer would be very much interested in learning whether this analysis of leaf rust epiphytology appears to be applicable in other States than Oklahoma. For a basis of comparison the dates mentioned in this account should be corrected by amounts indicated in U.S. Dept. Agr. Cir. 183 ("Seedtime and harvest," 1922). For example, April 1 in Oklahoma should be compared with May 1 in Iowa and southern Minnesota or with the middle of March in north-central Texas.
(OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER).

## WHEAT LEAF RUST AND OTHER GRAIN DISEASES IN OKLAHOMA IN 1942

K. Starr Chester

In the fall of 1941, leaf rust of wheat (Puccinia triticina) [P. rubigo-vera tritici] was exceedingly abundant in Oklahoma and Kansas. The winter was relatively mild and the rust could be found sporulating at all times. An abundance of inoculum was available March 1. The month of March was abnormally dry, and the rust made very little progress until early in April when abundant rains were experienced.

In Oklahoma, April 1942 has been the wettest April on record, the precipitation being in the neighborhood of 11 inches. During the month, fields in the vicinity of Stillwater showed a rapid increase in the amount of leaf rust. On April 28, a field of Turkey wheat on the Experiment Station farm was so heavily rusted at heading time that the plants will be practically defoliated in another 10 days.

Because of this alarming development, it was felt desirable to secure further information from the main wheat-producing areas of the State. On April 30 and May 1 a survey trip was made, following the route Stillwater--Perry--Tonkawa--Pond Creek--Enid--El Reno--Edmond--Guthrie--Stillwater. Fields were sampled every 5 miles. It was surprising, considering the abundant April rainfall, to find that leaf rust was extremely scarce throughout all of this area except in the immediate vicinity of Stillwater. In many fields it was impractical to collect enough rust for greenhouse culturing. Fields of Tenmarq wheat were practically rust-free, and plants of the more susceptible varieties ordinarily showed but a very light sprinkling of rust on the lower leaves and little or none at all on the uppermost 2 leaves. Much of the foliage, however, was mottled with chlorotic areas, interpreted as incipient rust lesions, capable of producing a considerable supply of inoculum for Northern areas within the next 10 days.

On the average, this wheat is in the boot stage or just heading, although a few fields were still in the jointing stage and Early Blackhull wheat was past blossoming stage.

There was little indication of other contagious disease. Speckled leaf blotch (Septoria tritici Desm.) was present but in relatively small amount on the lowest leaves and occasionally causing brilliant yellow lesions on the foliage. Small amounts of leaf rust (Puccinia anomala Rostr.) were found on barley, and in the two or three rye fields encountered, the rye leaf rust (Puccinia dispersa Eriks.) [P. rubigo-vera secalis (Erikss.) Carl.] was quite abundant. No crown rust or stem rust has been seen or reported thus far.

On May 1, Mr. W. M. Osborn forwarded specimens of wheat representative of the leaf rust infestation in the vicinity of Lawton, Oklahoma. The leaves bore scattered pustules of an intensity estimated at 25%. Mr. Osborn mentions that rust development has been inhibited until the past 10 days, during which time it has been favored by abundant rainfall. No stem rust was reported from Lawton.

On May 2, Mr. V. C. Hubbard of the Woodward, Oklahoma experiment station, also forwarded specimens of wheat rather lightly rusted. He also remarks that the disease has been quite inactive until the past 2 weeks, and the wheat is sufficiently advanced that serious damage from leaf rust is not expected. Mr. Hubbard indicates that the situation in the Panhandles of Oklahoma and Texas is similar to that about Woodward.

The scarcity of leaf rust following an extremely rainy month of April suggested that March precipitation and temperatures of winter and early spring are of much greater importance in wheat leaf rust epiphytology than the weather of April, the month during which the rust commonly becomes most apparent in Oklahoma. This observation suggested a phenological analysis of leaf rust outbreaks in past years. Such an analysis has been made and fully supports the view that so far as Oklahoma is concerned, the weather from April 1 onward has very little to do with the destructiveness of leaf rust in any given year.
(OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER).

## ADDITIONAL REPORTS ON DISEASES OF SMALL GRAINS

CEREAL RUSTS IN KANSAS: This spring in north-central Kansas has been the nearest "normal" that the writer remembers. There have been no sudden severe freezes or frosts following long periods of warm weather during which plant growth came on too rapidly. Although the winter was mild, normally cold weather persisted well into March and prevented plants coming out of dormancy too soon or too rapidly. While rainfall is below normal for the first 4 months of the year in the vicinity of Manhattan, there still is an abundance of moisture in the soil. In the western part of the State more rain has fallen than at Manhattan. Rains ranging from 1/2 inches to more than 2 inches fell in most parts of the State last weekend. A total of .59 inch was received here.

Leaf rust [Puccinia rubigo-vera tritici] of wheat overwintered in fair abundance as far north as Manhattan, but there has been almost no natural increase owing to low night temperature.

Trapping of rust spores was started on April 1 and some spores of both leaf rust and stem rust are being trapped. The numbers to date have been low. Reports from Texas indicate that leaf rust of wheat, crown rust [P. coronata] of oats, and stem rust [P. graminis] on both wheat and oats are plentiful in the lower Rio Grande Valley and around San Antonio. The damage to small grains caused by greenbugs in north-central Texas and south-central Oklahoma may reduce or delay the northward migration of cereal rusts this year. (C. O. Johnston, Division of Cereal Crops and Diseases, Bureau of Plant Industry. April 22).

GRAIN DISEASES REPORTED FROM CALIFORNIA: April, to date, has been cold and unusually wet, precipitation totaling 3.32 inches. Scald [Rhynchosporium secalis] on barley and septoria [S. tritici] on wheat are severely damaging leaves of susceptible varieties. Oat stem rust is the only rust sufficiently abundant locally to be threatening at this time. Lodging will probably be severe.

Barley stripe [Helminthosporium gramineum], which was only rarely encountered from 1937 to 1940, is "on the loose." One-third of the fields examined on a trip over Yolo County last week showed more than 1% diseased plants and several more than 10%, even though plants were generally not sufficiently developed to give full expression to the disease. (C. A. Suneson, Division of Cereal Crops and Diseases. April 14).

## WHITE ROT OF ALLIUM IN LOUISIANA

E. C. Tims

On March 19, 1942, white rot, caused by Sclerotium cepivorum Berk., was found on shallot plants (Allium ascalonicum) on a farm in the outskirts of the town of Convent, St. James Parish, Louisiana. This is the first authentic record of the disease in this State. A few days later it was also found on garlic (Allium sativum) and onion (Allium cepa) on the same farm. Specimens of the infected shallots were sent to J. C. Walker, who verified the diagnosis.

Later observations showed that the white rot disease appears to be limited in the principal shallot-growing area of the State to a few farms within some 10 miles of the town of Convent. One minor infection was found near Union, Ascension Parish, only a few miles from the infections around Convent. Just how long the disease may have been present in this area is not known. One farmer said he had seen it for several years. His description of the disease and how it spread indicated that he was probably correct in his statement. One farmer said his shallots had been dying all during the past winter, but he had apparently paid little attention to the disease condition and had not reported the trouble to the plant pathologists.

While the disease was quite severe in the infected areas, it had apparently not spread to any very great extent. On the farm where infected onions were found there were only a few diseased plants in the vegetable garden. The infected shallots were found in a nearby plot of

possibly 3 acres. A row of garlic planted among the shallots was almost wiped out by the disease. Infected garlic plants were found on 2 other farms, the disease there having been very destructive on both garlic and shallots. Some areas were found in which all the plants were killed while around the edges of the infected areas there were plants in various stages of decay. Altogether the known infected fields comprised an area of some 15 acres on 4 different farms. Observations indicated that the disease might be equally severe on garlic or shallot when grown in infested soil. No intensive survey was made of the shallot, garlic, or onion-growing sections of the State, but some representative fields were examined in the area extending from Angola, some 60 miles above Baton Rouge, down the Mississippi River to Laplace and down Bayou Lafourche as far as Schriever.

White rot caused some concern among onion growers and plant pathologists in this country about 20 years ago following the description of the disease in Europe by Walker (6). According to Walker it was widespread in western Europe and in certain onion-growing sections caused serious damage to onion, leek, and garlic. Later Walker (7) mentioned that only two authentic reports had been made of white rot in the United States, on garlic and onions in Oregon in 1918 and on onions near Norfolk, Virginia, in 1923. A third authentic report of the disease in America was made in 1925 by Valleau (5), from Kentucky.

In 1926 Walker (8) published studies on the effect of soil temperature and soil moisture on white rot of multiple onion, Welch onion, and garlic. He found that the disease developed best at comparatively low temperatures, 10° - 20° C., at 20° and 22° C. there was a marked reduction in infection, and at 24° C. or above the disease did not develop. His earlier observations in Europe indicated that white rot was most destructive during the earlier portion of the growing season and that its progress was checked by the warmer midsummer weather. Walker's tests also indicated that a moisture content of about 40% of the water-holding capacity of the soil was most favorable for the development of the disease.

In 1925 McWhorter (4) reported the recurrence of white rot of shallot near Norfolk, Virginia, in new land. The shallot sets had come from Louisiana, and he inferred that the disease might have been brought in on the infected sets. Wingard (9) in 1930 reported an attempt to control white rot in the field in Virginia. The plot consisted of about one-fourth acre in which the onion bulbs were treated with formaldehyde before planting, one row being left as a control. There were practically no healthy onions in the entire plot at the end of the season, those in the treated row being as badly diseased as the ones that were not treated. Wingard thought that infection probably came from the garden and remained on the farm several years.

In 1936 Edson (2) quoted a report from the New Jersey Agricultural Experiment Station, Department of Plant Pathology, that "White rot (Sclerotium cepivorum) was severe in one field in New Jersey. It occurs in several sections of the State but is not generally distributed." In 1938 Gardner (3) reported its occurrence on garlic in California in one field in San Mateo County, and in another planting in San Benito County.*

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* [Also, in 1940, C. E. Scott reported its occurrence in Mendocino County on onion - PDS]

Cook (1) in 1939 again reported having received a specimen of white rot of onion from Warwick County, Virginia. The onion was taken from a field just across the road from the farm where McWhorter found the disease in 1924-25. No onions had been grown on this farm for 15 years, but at the time the specimen was sent in 75% of the plants were badly affected. In recent years there have not been many reports of white rot, and apparently it has not become so widespread and destructive as had been feared.

The white rot disease is potentially a very serious disease of garlic, onion, and shallot in Louisiana. These crops are all grown during the winter and spring seasons when temperature conditions are favorable for the development of the disease. Sclerotia are produced in large numbers on the infected plants. Most of these plants die and are left in the fields, and as they disintegrate the sclerotia are left in the soil to serve as a source of infection. The sclerotia in the infected soil may be carried from one field to another, or to different parts of the same field on farm implements, or on the feet of livestock or workmen. According to Walker (7) the fungus is known to live for several years in the soil without the presence of the host plant. The disease may also be introduced to uninfected areas by the use of infected shallot sets or garlic cloves for planting. Thus there are numerous possibilities for the spread of white rot in the shallot and garlic-growing sections of southern Louisiana.

1. Cook, H. T. Reccurrence of white rot of onion in Virginia. Plant Dis. Reporter 23: 5. 1939.
2. Edson, H. A. Diseases of plants in the United States in 1935. Plant Dis. Reporter Suppl. 96: 190. 1936.
3. Gardner, M. W. Sclerotium cepivorum found on garlic in California. Plant Dis. Reporter 23:36. 1939.
4. McWhorter, F. P. Sclerotium cepivorum recurs in the Norfolk section of Virginia this year. Plant Dis. Reporter 9: 5. 1925.
5. Valleau, W. D. White rot (Sclerotium cepivorum) of onion reported from Kentucky. Plant Dis. Reporter 9: 46-47. 1925.
6. Walker, J. C. Observations on the cultivation and diseases of cabbage and onions in Europe. Plant Dis. Reporter Suppl. 32: 3-34. 1924.
7. Walker, J. C. Occurrence of white rot of Allium (Sclerotium cepivorum Bork.) in Europe and America. Phytopath. 14: 315-322. 1924.
8. Walker, J. C. The influence of soil temperature and soil moisture upon white rot of Allium. Phytopath. 16: 697-710. 1926.
9. Wingard, S. A. White rot of onions in Virginia. Plant Dis. Reporter 14: 104-105. 1930.

(LOUISIANA AGRICULTURAL EXPERIMENT STATION, BATON ROUGE).

## WETTABLE SPERGON NOT EFFECTIVE AS A SURFACE DISINFECTANT OF SWEETPOTATOES USED FOR SEED

H. T. Cook and L. L. Harter

O. H. Elmer (PDR 26 (2): 44-46. 1942) called attention to the possible value of Spergon for treating sweetpotato "seed" before bedding and suggested that other investigators test it for this purpose. Accordingly Wettable Spergon was included in tests that were being conducted at the Virginia Truck Experiment Station in an effort to find a suitable substitute for the standard corrosive sublimate treatment used successfully for the last 30 years, but not now practical because of the high cost and scarcity of mercury.

Since the primary purpose of treating sweetpotato seed is to prevent infection by black rot [Ceratostomella fimbriata] spores frequently present on the surface, preliminary tests were conducted in the laboratory to determine whether or not Wettable Spergon and certain other materials, compared with corrosive sublimate, would prevent infection. Sweetpotatoes were peeled and cut into cubes that were dipped in an aqueous suspension of dry, powdered, black-rot infected sweetpotato tissue. The cubes were treated in the various chemical solutions and then placed in separate moist chambers and incubated at room temperature for 1 week. The untreated check was soaked in a volume of water equal to the volume of the treating solutions used.

Wettable Spergon was used in these tests at concentrations of 2, 4, and 6 ounces in a gallon of water; corrosive sublimate at 1-1000. In the first test the sweetpotato cubes were merely dipped in the Spergon solution for about 1-1/2 minutes; in the others they were soaked for 10 minutes. In all tests treatment with corrosive sublimate was for 10 minutes. The results are given in the following table.

| Treatment | Growth of black rot fungus on treated sweet potato cubes | | |
|---|---|---|---|
| | 1st test | 2nd test | 3rd test |
| Check (untreated) | Abundant | Abundant | Abundant |
| Corrosive sublimate | None | None | None |
| * Spergon 2 oz. - 1 gal. | Moderate | Abundant | Abundant |
| Spergon 4 oz. - 1 gal. | Moderate | Moderate | Abundant |
| Spergon 6 oz. - 1 gal. | Slight | Moderate | Abundant |

* Concentration used by Elmer as a dip.

Since Wettable Spergon failed to control black rot even when the seed was soaked in the strongest solution, it does not appear to be a suitable material for treating sweetpotato seed for disease control. Some of the other materials used in these preliminary tests controlled black rot as effectively as the standard corrosive sublimate treatment and their effect on sprout production is now being tested. Because of the present emergency the complete results of these tests probably will be published as soon as they are completed early in June.

(VIRGINIA TRUCK EXPERIMENT STATION, NORFOLK; AND DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY).

## BRIEF NOTES ON PLANT DISEASES

DISEASES IN CIGAR-WRAPPER TOBACCO PLANT BEDS IN FLORIDA IN 1942: Downy mildew (Peronospora tabacina) appeared late this season, and caused slight damage in a few commercial beds. Two new spray materials tried at Quincy, Florida, appeared promising for downy mildew control when applied twice a week. Ferric dimethyl dithiocarbamate (du Pont's IN-870 A3), 1-1/2 pounds per 100 gallons, gave excellent control, a little better than cuprous oxide-cottonseed oil emulsion; leaves sprayed with this new material were much darker green than unsprayed leaves. Tetrachloro-para-benzoquinone (U. S. Rubber Company's Spergon), paste form, 40% active ingredient, 4 pounds per 100 gallons, gave good control, about the same as cuprous oxide-cottonseed oil emulsion. The disease appeared in the plots 4 weeks after spraying was started and 1 week before the first transplanting. There was no evidence of plant injury by the new materials, except slightly yellowish blotches on leaves bearing a heavy black deposit of the du Pont material. Plants sprayed with both materials lived well when transplanted in the field.

Black-leg (Bacillus aroideae Towns.) [Erwinia] killed 10% of the plants in a 5000-sq. yd. commercial bed. The stand was extremely thick, and following a heavy rain on April 16, patches of plants became involved in a wet, slimy rot, collapsed and turned black. This is apparently the first record of the occurrence of black-leg in plant beds in Florida. (Randall R. Kincaid, North Florida Experiment Station, Quincy, Florida).

PINK ROOT OF SHALLOTS IN LOUISIANA: Pink root, Phoma terrestris, was apparently the most serious disease affecting shallots during the latter part of the growing season. Infection ran as high as 5% in some fields, and practically no fields were found free of the disease. The diseased plants were stunted, the tips of the leaves were yellow, and the root systems were poorly developed. Most of the pink-root infected plants were too small and unsightly to be sold. (E. C. Tims. Louisiana Agricultural Experiment Station, Baton Rouge).

AMERICAN PHYTOPATHOLOGICAL SOCIETY EMERGENCY COMMITTEE ON PLANT DISEASE PROBLEMS: In the A.A.A.S. Bulletin for May (1 (3):18-19) J. G. Leach names the members of this committee and states the problems that face it.

## APRIL WEATHER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending May 5, 1942).

Except very locally, the temperature for April averaged above normal in all sections of the country, as shown by Figure 1. East of the Rocky Mountains the pattern was quite similar to that for the preceding month. While the monthly means for April were slightly above normal and somewhat higher than for March in the Southern States, central and northern sections had abnormally warm weather with plus anomalies

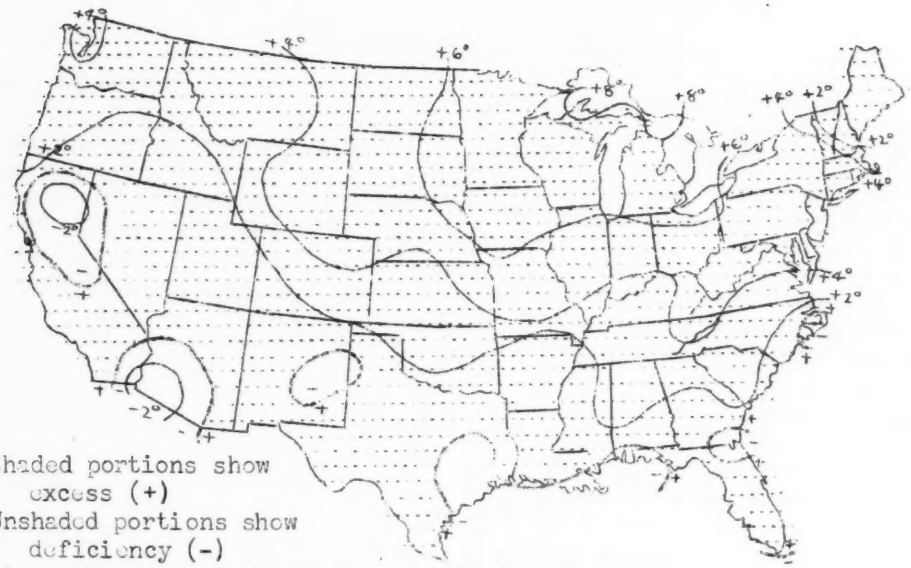


Figure 1. -- Departure of Mean Temperature from the Normal for April 1942.

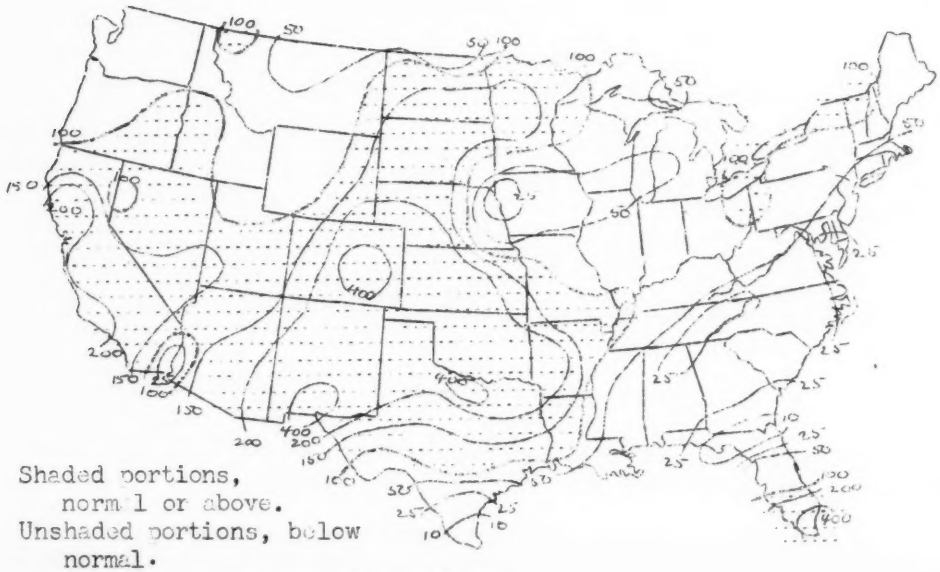


Figure 2. -- Percentage of Normal Precipitation for April 1942.

ranging mostly from 4° to 11°, comparable with those for March. West of the Rockies temperatures averaged slightly above normal, except locally, in contrast with decidedly subnormal values last month in much of the area.

While the temperature anomalies for the 2 months were quite similar, the precipitation pattern, see Figure 2, was markedly at variance in several respects. March was decidedly dry in a large southwestern area and much wetter than normal in most of the Atlantic States, while April had abnormally heavy rains over approximately the same southwestern section and one of the driest Aprils of record in much of the East. In the Atlantic area the scanty rainfall extended from New England southward and southwestward to northern Florida and Mississippi with practically all stations reporting less than half the normal rainfall and some having less than 10 percent of normal.

The following summary affords an indication of the extent of the drought and a comparison with previous records in some areas. At Hartford, Connecticut, it was the driest April since the beginning of the record in 1847; at Baltimore, Maryland, the monthly total, 0.88 inch, equaled April 1922, the previous driest since 1869; Washington, D. C., the driest in 95 years; Richmond, Virginia, the driest of record, the next driest being April 1888 with more than twice as much rainfall; Charlotte, North Carolina, the second driest of record; both Savannah, Georgia, and Jacksonville, Florida, the driest in 50 years; and Birmingham, Alabama, and Chattanooga, Tennessee, the driest of record. While northern Florida was very dry, extreme southern Florida had heavy rains; Miami reported 13.62 inches, by far the greatest April rainfall of record.

Between the Mississippi River and Rocky Mountains there were a couple of restricted sections, Iowa and extreme southern Texas, with markedly deficient rainfall, but elsewhere the amounts were much above normal, especially in the Southwest where a large area had from two to four times the normal amount of rain for the month. At North Platte, Nebraska, it was the wettest April since 1875, while Pueblo, Colorado, Dodge City, Kansas, and Ft. Worth, Texas, all had the second wettest of record. In the far West, California had a decidedly wet month, but rainfall was below normal in the Pacific area north of California.